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Eric Lawrence Barsness

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MARTIN & ASSOCIATES, LLC
P.O. BOX 548
CARTHAGE, MO 64836-0548

EXAMINER

LE, MICHAEL

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ERIC LAWRENCE BARSNESS
and JOHN MATTHEW SANTOSUOSSO

Appeal 2009-003124
Application 10/733,752
Technology Center 2100

Decided: September 11, 2009

Before LEE E. BARRETT, LANCE LEONARD BARRY, and
HOWARD B. BLANKENSHIP, *Administrative Patent Judges*.

BLANKENSHIP, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

This is an appeal under 35 U.S.C. § 134(a) from the Examiner's final rejection of claims 1-29, 32-38, 41-43, 46, and 47, which are all the claims remaining in the application. We have jurisdiction under 35 U.S.C. § 6(b).

We reverse.

Invention

Appellants admit that database constraints are known in the prior art, such that the constraints are used to limit data that may be entered into a database. For example, a range constraint may limit an age entry to values from 1 to 99. Spec. 2: 1-7. According to Appellants, however, “static” range constraints require manual adjustment of the fixed numerical limits. *Id.* at ll. 8-14.

Appellants’ invention includes “dynamic” range constraints that determine the limits by analyzing data in the database, thus to avoid the requirement of manual adjustment of the constraints. *Id.* at 6: 9-13.

Representative Claim

1. An apparatus comprising:
 - at least one processor;
 - a memory coupled to the at least one processor;
 - a database residing in the memory;
 - a range constraint defined for the database, the range constraint including at least one limit that is dynamically determined from data in the database; and
 - a database manager residing in the memory and executed by the at least one processor, wherein the range constraint defines a range that includes the at least one limit, and wherein the database manager allows entry of data into the database when the data lies within the range.

Prior Art

Bakuya	5,680,614	Oct. 21, 1997
Geppert	6,463,429 B1	Oct. 8, 2002
Zuzarte	2003/0084025 A1	May 1, 2003

Examiner's Rejections

Claims 1-6, 8, 9, 11-13, 15-24, 29, 32-36, 38, 41, 43, and 46 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Bakuya and Zuzarte.

Claims 7, 10, 14, 25-28, 37, 42, and 47 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Bakuya, Zuzarte, and Geppert.

DISCUSSION

The issue in this appeal is whether the prior art provided by the Examiner teaches a range constraint defined for a database, the range constraint including at least one limit that is dynamically determined from data in the database, as recited in claim 1. We consider claim 1 to be representative, as each of the other independent claims contains a limitation similar to that of claim 1.

The Examiner applies the combination of Bakuya and Zuzarte against claim 1. The rejection acknowledges that Bakuya does not teach at least one limit that is dynamically determined from data in the database. However, the rejection contends that the deficiency of Bakuya is remedied by Zuzarte, which is deemed to teach creating database constraints from information gained from a statistical analysis. The rejection points to paragraph [0020], lines 6 through 12 of Zuzarte for the teaching. Ans. 3-4.

Zuzarte at paragraph [0020] describes using statistical information that can be generated for a “virtual” column, which is a column that results from an expression involving one or more actual columns. Statistical information about the virtual column can be generated with respect to the high and low values, the cardinality, the frequency of values, and histogram statistics. From these statistics, the database management system can create “statistical constraints” that reflect a characteristic of the virtual column. The statistical constraints can then be used by the query optimizer to assist in estimating cardinalities.¹

Appellants argue that the “statistical constraints” taught by Zuzarte are used for estimating cardinality in the optimization of a query. According to Appellants, the statistical constraints in Zuzarte are not used to limit the data that may be entered into a database, and have nothing to do with range constraints or other integrity constraints.² App. Br. 8; *see also id.* at 7-15.

The Examiner responds to Appellants’ argument.

Bakuya discloses range constraints that include at least one limit. Bakuya at fig. 6. It is conceded that Bakuya does not expressly disclose that at least one limit is dynamically determined from the data in the database. Zuzarte discloses performing a statistical analysis on a particular column regarding information such as high and low values and creating constraints from the statistical information. Zuzarte at para. 0020, lines 6-12. Bakuya’s range constraint, modified by Zuzarte’s feature of performing a statistical analysis on a

¹ “Cardinality estimation” refers to estimation of the number of rows that will be involved at each step of a query plan. Zuzarte ¶ [0002].

² “Integrity constraints” (or business rules) describe conditions about a database that must be true, which appear to include range constraints. *See* Zuzarte ¶ [0007].

particular column of data, would result in a range constraint with one limit dynamically determined from the data.

. . . The statistical analysis disclosed by Zuzarte can be utilized to determine constraints, especially since the statistical analysis considers the high and low values of data in a column of a table in a database. While Zuzarte does not use the statistical information to create integrity constraints, one of ordinary skill in the art would be motivated to combine this feature with the range constraints of Bakuya.

Ans. 12.

Consistent with Appellants' position, Zuzarte teaches that the "statistical constraints" are different from ordinary integrity constraints, in that the statistical constraints are not necessarily valid for all of the data. Zuzarte thus refers to the "statistical" constraints as "statistical soft constraints (SSCs)." Zuzarte ¶ [0021].

Upon consideration of the Zuzarte reference as a whole, we agree with Appellants that Zuzarte does not teach that the "statistical constraints" are useful in determining any kind of range constraints. The SSCs are, instead, used in query optimization and, in particular, for assisting the query optimizer in cardinality estimation.

The Examiner's rejection appears to acknowledge that the "statistical constraints" of Zuzarte are not used in the determination of range constraints (or the more general "integrity" constraints), but seems to propose that the artisan would be motivated to apply the statistical analysis of the virtual columns as taught by Zuzarte to the "static" range constraints of the prior art, as taught by Bakuya, to thus dynamically determine the range constraints from data in the database. At best, however, the rejection shows that, in

retrospect, the statistical analysis taught by Zuzarte might be useful in the dynamic determination of range constraints as taught by Appellants.

A factfinder should be aware of the distortion caused by hindsight bias. *KSR Int'l v. Teleflex Inc.*, 550 U.S. 398, 421 (2007). Upon consideration of the evidence provided in support of the rejection, we are persuaded by Appellants that the only objective reason for making the proposed combination arises from the teachings in Appellants' disclosure with respect to dynamic determination of range constraints.

We thus do not sustain the rejection of claims 1-6, 8, 9, 11-13, 15-24, 29, 32-36, 38, 41, 43, and 46 under 35 U.S.C. § 103(a) as being unpatentable over Bakuya and Zuzarte. We also do not sustain the rejection of claims 7, 10, 14, 25-28, 37, 42, and 47, as Geppert does not -- nor is the reference purported to -- supply the teachings that are missing in the combination of Bakuya and Zuzarte.

DECISION

The rejection of claims 1-29, 32-38, 41-43, 46, and 47 under 35 U.S.C. § 103(a) over the applied prior art is reversed.

REVERSED

msc

MARTIN & ASSOCIATES, LLC
P.O. BOX 548
CARTHAGE MO 64836-0548